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ECO PLATFORM EPD VERIFIED

AENOR

Wire rod for prestressing steel

Environmental Product Declaration

EN ISO 14025:2010
EN 15804:2012+A2:2019/AC:2021

Sostenibilidad Siderúrgica

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Independent verification of the declaration and data, according to EN ISO 14025:2010 standard

☐Internal ☒External

Verification agency

AENOR

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1. General information

1.1. The company

"Sostenibilidad Siderúrgica" is an associative and non-profit entity, which members are the main Spanish steel companies.

The association "Sostenibilidad Siderúrgica" aims to promote Sustainability and Corporate Social Responsibility (CSR) strategies in a coordinated manner among all member companies, with the clear purpose of supporting the interests of the organisation's members throughout their business activities, in their engagement with various business sectors and with different government authorities.

The association "Sostenibilidad Siderúrgica" seeks to become a meeting point for joint actions among public administrations, private institutions, companies, and other economic, social, and labour stakeholders.

The main objectives of the association "Sostenibilidad Siderúrgica" are:

- To maintain and strengthen cooperation among its members.
- Promoting the concept of sustainability and CSR in the steel sector.
- Creating a Sustainability Brand.
- To represent and defend the common interests of the members.
- Promotion of steel certification techniques.
- Collaborate with the public administrations and private institutions in order to promote best practices in the steel sector.
- Prepare sector-specific documents that respond to the sustainability and CSR objectives and strategies of the association.
- Boosting and promoting the Spanish presence in international forums.
- Organize activities to achieve the association's objectives.

1.2. Scope of the Declaration

In this EPD, the system boundary was defined as cradle-to-gate with options, A4, C1-C4 modules and D module (A1-A3 + A4 + C + D) of wire rod intended for the production of cold formed wire for prestressing steel for concrete (generic name "wire rod for prestressing steel").

The function performed by the studied product system is the production of steel to be used as a structural element in the construction sector.

1.3. Life cycle and conformity

This sectoral EPD has been developed and verified according to Standards 14025:2010, UNE 36904-1:2018, EN 15804:2012+A2:2019 and, EN 15804:2012+A2:2019/AC:2021.

Table 1-1. 1

Title	Iron and steel industry. Environmental product declarations. Product category rules for steel products for concrete and steel structures. Part 1: Hot rolled non-alloy steel long products from electric furnace.
Registration/ version code	UNE 36904-1
Date of issue	2018
Programme administrator	AENOR

Table 1-2. System boundaries. Information modules considered

Product stage	A1	Raw material supply	X
	A2	Transport to factory	X
	A3	Manufacturing	X
Construction	A4	Transport to site	X
	A5	Construction installation	ND
Use stage	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational energy use	ND
	B7	Operational water use	ND
End of life stege	C1	Deconstruction / demolition	X
	C2	Transport	X
	C3	Waste processing	X
	C4	Disposal	X
	D	Reuse/recovery/ recycling potential	X
X = Module included in the LCA; ND = Module not declared			

This EPD may not be comparable with those developed in other programmes or according to different reference documents; in particular, it may not be comparable with declarations not developed and verified according to EN 15804.

In addition, EPD may not be comparable if the data source is different (e.g., databases), if not all relevant information modules are included, or if they are not based on the same scenarios.

The comparison of construction products must be done on the same function, applying the same declared unit at the building level (or architectural or engineering work), i.e., including the behaviour of the product throughout its entire life cycle, as well as the specifications of section 6.7.2 of the EN ISO 14025 Standard.

1.4. Differences with previous versions of this EPD

This sectoral EPD corresponds to the second version of the study.

- First version (2020): Valid until 2025.
  - based on production data from 2016 and 2017.
  - SimaPro calculation software version 9.0.0.30.

2. The product

2.1. Product information

This sectoral EPD applies to wire rod (long product of hot rolled structural non-alloy steel coming from electric furnace) intended for the production of cold formed wire for prestressing steel for concrete. The generic name is “wire rod for prestressing steel”.

Wire rod for prestressing steel is a hot-rolled product with a solid round, elliptical or polygonal cross-section, supplied in the raw rolling state, in single-length coils wound in non-aligned spirals (“wild coil”), but capable of being unwound regularly during the subsequent transformation process.

The intended use of the product is as a structural element in the construction sector.

CPC Code: 4124 – Bars and rods of iron or steel, hot-rolled.

2.2. Product features

Wire rod for prestressing steel is an intermediate product that undergoes further cold deformation operations (drawing, stretching or rolling), to produce high elastic limit wires that will form part of active reinforcements (wires and cords) for prestressed concrete.

2.3. Product composition

The following average composition of the product studied is declared, obtained based on the total tons manufactured by each plant:

Table 2-11

Material	% by weight
Post-consumer scrap	37.84%
Pre-consumer scrap	38.51%
Pig iron	17.13%
Pre-reduced	6.53%

These are non-alloy steel products, in which the content of any of its elements is below certain limit values (UNE-EN 10020).

No hazardous substances listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorisation” are used during the product's life cycle in a percentage greater than 0.1% of the product weight.

2.4. Packaging

Primary packaging used in shipping of the product (distribution packaging) has been included in the study. Data was obtained as an average of all plants participating in the study.

Table 2-2 2 Packaging

Material	kg / declared unit
Steel wire rod	3.07E-02
Paper/cardboard	1.73E-01
PS plastic	5.52E-02
PVC plastic	7.15E-07
PP plastic	2.24E-03
Wood	4.72E-01

2.5. Product properties

The chemical composition and mechanical properties are established in the following product standards:

- UNE-EN ISO 16120-1, Non-alloy steel wire rod for conversion to wire — Part 1: General requirements.
- UNE-EN ISO 16120-4, Non-alloy steel wire rod for conversion to wire. Part 4: Specific requirements for wire rod for special applications.

3. LCA information

3.1. Life cycle assessment

The Life Cycle Assessment Report for the sectoral EPD of hot-rolled non-alloy steel products in electric arc furnaces for the association "Sostenibilidad Siderúrgica", dated November 2025, was developed by the company Abaleo SL

The LCA study follows the recommendations and requirements of the international standards ISO 14040:2006, ISO 14044:2006, UNE 36904-1:2018 and the European Standard EN 15804:2012+A2:2019/AC:2021.

3.2. Scope of the study

The scope of this sectoral EPD is cradle-to-gate with options and modules C and D (A1-A3 + A4 + C + D) of wire rod for prestressing steel.

Specific data on the production process were obtained from the plants where the product is manufactured, located in Portugal and Spain, and corresponds to the production data of the year 2022, which is considered representative:

- Global Steel Wire SA, Celsa Group. Santander, Cantabria (Spain)
- SN Seixal, SA, Megasa Group. Seixal (Portugal).

The product is manufactured in Spain and Portugal and distributed worldwide, although the LCA calculation has been carried out for Europe.

The following processes have not been included in the LCA:

- The manufacture of certain water treatment products used at the plant was excluded due to the lack of a representative process. These materials represent less than 0.1% of the weight of the product under study. Their transport from the supplier to the facility where they are used was taken into account.
- The briquetting process of Direct Reduced Iron (DRI) to obtain the pre-reduced materials used, because there is no process available in the databases used.
- All equipment which service life is longer than 3 years.
- The construction of the plant buildings, nor other capital goods.
- Work-related travel by staff; nor commuting.
- Research and development activities.
- Long-term emissions.

3.3. Declared unit

The declared unit is one tonne (1,000 kg) of product, plus its distribution packaging.

3.4. Allocation rules

According to the criteria of the reference standard, the allocation of system inputs and outputs has been based on economic values because the difference between product revenue and co-products is very high. This allocation criterion has been applied to general plant consumption (raw material and energy consumption), emissions, transportation and waste.

The quantities of the different materials used and produced in the manufacturing process come from measurements carried out at the steel plants themselves.

All facilities provided data from 2022. The criterion used to prepare the sectoral EPD was that each company contribute to the environmental impact of its production process in the same proportion as it contributes to the total production of the companies included in this study, for each of the four steel products analysed. For this purpose, each product manufactured by each plant was modelled independently.

The LCA results for the final product life cycle were obtained as a weighted average of the impacts of each product stage of each plant, according to its production relative to the total manufactured for each of the steel products by the participating companies.

The manufacture of the studied steel generates the following co-products:

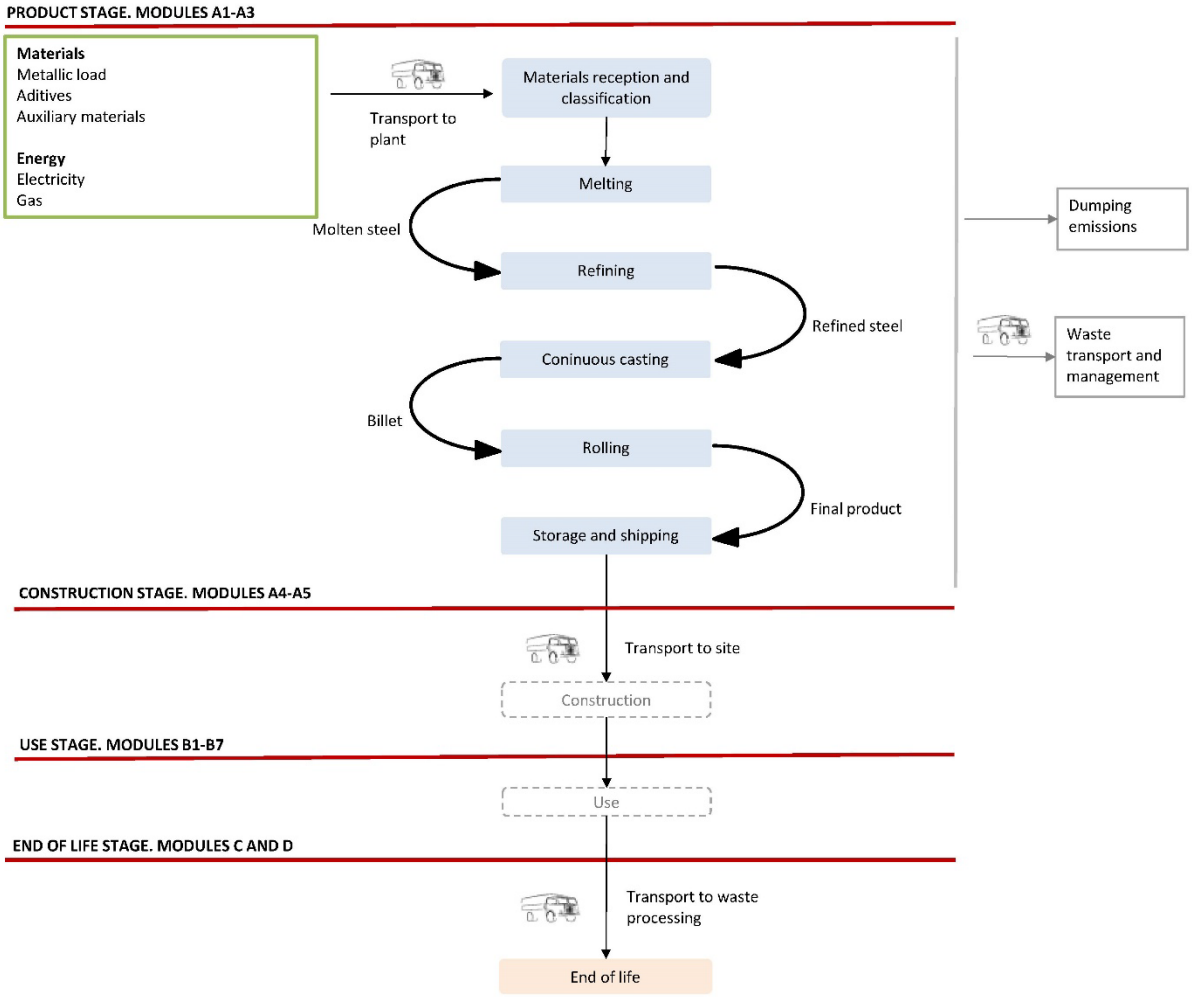
- Slag - valuable as aggregate for various uses, for example, as aggregate for civil construction (e.g., road fill), for the manufacture of clinker, cements and concretes and for the glass industry.
- Steelmaking dust - valorised to recover its high zinc content by replacing the use of naturally sourced zinc.
- Refractory material - valued as aggregates for several uses, mainly in the manufacture of concrete and as aggregate for civil construction.
- Ferrous waste - considered as scrap metal to be used as raw material.
- Rolling mill flakes - used for iron applications due to their high iron oxide content.

3.5. Cut-off rules

The LCA includes the gross weight/volume of all materials used in the manufacturing process, so that at least 99% of the environmental impacts are obtained.

There has been no exclusion of energy consumption.

3.6. Manufacturing process diagram



The production process begins in the steel mill, where semi-finished products (billets, rounds, slabs, or ingots) are obtained with the necessary quality (chemical composition) to produce the final product. This process involves melting the raw materials in an electric arc furnace and refining them in a refining furnace.

After the electric arc furnace steelmaking process, the liquid steel is poured (cast) to solidify in the process called continuous casting: the steel is poured into an open-bottom mould, which cross-section has the desired shape, and from which the solidified steel is continuously extracted, which is then cut to the desired length to produce billets or rounds.

The billet proceeds to the rolling process, where the final steel product is hot formed. This may require reheating the billet in furnaces, mainly fuelled by natural gas. Hot rolling involves passing the semi-finished cast products between two rollers. There are a number of machines responsible for these processes, which are usually organised into rolling mills. This rolling technique allows the production of constant cross-section products (profiles, bars, wire rods).

3.7. Representativeness, quality and selection of data

To model the manufacturing process of the studied product, specific production data from the participating steel plants, from the year 2022, have been used, which is a period with representative production data.

The production of the participating steelmaking centres represents more than 95% of the market for the production of wire rod (long product of hot rolled structural non-alloy steel coming from electric furnace) intended for the production of cold formed wire for prestressing steel for concrete, in Spain and Portugal.

The plants participating in this LCA are authorized as a ferrous metal waste treatment facility for recovery operations, using the scrap they receive directly as secondary raw material in the production process without any prior treatment before melting in the electric furnaces; therefore, the scrap used as raw material is considered free of charge, as well as its transport to the steel mills, which impact corresponds to the previous product system.

Internal scrap consumed has not been considered in the calculation of the secondary material used indicator.

When necessary, the Ecoinvent 3.11 database (March 2025) was used, which is the latest version available. For the inventory data, to model the LCA, and to calculate the environmental impact categories required by the reference standard, SimaPro 10.2.0.0 software was used, which was the most up-to-date version available.

To assess the quality of the primary data used in the LCA, the semi-quantitative data quality assessment criteria proposed by the European Union in its Guide to the Environmental Footprint of Products and Organizations were applied. The following results were obtained:

- Completeness: very good.
- Methodological appropriateness and consistency: good
- Time-related representativeness: very good.
- Technological representativeness: good.
- Geographical representativeness: very good.
- Uncertainty: low.

According to the above data, the Data Quality Rating (DQR) takes the following value 1.5, which indicates that the quality of the data is excellent.

To better understand the data quality assessment performed, the score for each of the criteria varies from 1 to 5 (the lower the score, the higher the quality). The following table is applied to obtain the final score:

Overall Data Quality Rating (DQR)	Overall data quality level
≤ 1.6	Excellent quality
1.6 to 2.0	Very good quality
2.0 to 3.0	Good quality
3 to 4.0	Fair quality
> 4	Poor quality

4. System boundaries, scenarios and additional technical information

Module A1: Raw material supply

This module includes the raw material production process, which considers:

- Extraction of resources and production of raw materials.
- Transport to the processing/production centres of raw materials.
- Energy and fuel consumption during the production of raw materials.
- Consumption of other resources (such as water) during production of raw materials.
- Generation of waste and emissions into the air and spills into water and soil, during the production of raw materials.
- Generation of the electricity used in the manufacturing process.

Module A2: Transportation

Transport of raw materials and supplies by truck, ship, and train from the production sites (suppliers) to the steel mills has been considered. The transport distances were provided by the plant managers, who were aware of the location of their suppliers' facilities.

Internal plant transport is also included.

Module A3: Manufacturing

This stage considered the consumption of auxiliary materials for production (auxiliary materials and general plant supplies); production of packaging necessary for product distribution to the customer; air and water emissions; and transport of waste generated during this stage of the life cycle to a waste management facility. Waste transport distances were provided by plant managers, who were aware of the locations of their waste management facilities.

Module A4: Transport to site

Transport of the finished product from the plants where the steel is manufactured to the customer has been considered, using data from the year 2022, distinguishing the means of transport used: EURO 6 truck (18-32 ton), average European freight train or container ship.

Table 4-11A4 module parameters

Parameter	Value (per declared unit)
Liters of diesel: - Truck - Train - Ship	 0.044 l/tkm 0.013 l/tkm 0.003 l/tkm
Average distance - Truck - Train - Ship	 375.49 km 613.27 km 1,889.10 km
Occupancy coefficient (including empty return)	50%
Apparent density of the transported products	7,850 kg/ m^3
Useful capacity factor	1

Module C1: Deconstruction / demolition

The LCA assumed that 100% of the manufactured steel product was used as reinforcement in construction, i.e., integrated into other structures.

A generic process from the Ecoinvent 3.11 database was used to represent the demolition process.

Module C2: Transport to the waste processing/recovery site

It is assumed that, at the end of its service life, the product under study is transported to the waste management facility by EURO5 truck (18-32 ton), average European freight train, or container ship. Average transport of scrap received at steel plants, which are authorized as waste processing facilities for recovery operations (R4 – recycling or recovery of metals and metallic compounds) have been considered.

Table 4-2. Stages and information modules of the Life Cycle according to UNE-EN 15804.

Life Cycle Information														Additional information
A1 to 3			A4 - A5		B1 to 7					C1 to 4				D
Product stage			Construction process stage		Use stage					End-of-life stage				Beyond system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
X	X	X	X	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Deconstruction / demolition	Transport	Waste processing	Waste disposal	Reuse-Recovery-Recycling-potential
			Sce-nario	Sce-nario	Sce-nario	Sce-nario	Sce-nario	Sce-nario	Sce-nario	Sce-nario	Sce-nario	Sce-nario	Sce-nario	

B6. Operational energy use	
Scenario	**ND**
B7. Operational water use	
Scenario	**ND**

X: Module evaluated

ND: Module not declared

Module C3: Waste processing, and Module C4: Waste disposal.

In order to determine the percentages of recycling and disposal in landfill and incineration of the studied products, the criteria of Part C of Annex 2 V2.1 (May 2020) of the *Circular Footprint* Formula of the European Union Environmental Footprint methodology were applied (*COMMISSION RECOMMENDATION (EU) 2021/2279 of 15 December 2021 on the use of the Environmental Footprint methods to measure and communicate the life cycle environmental performance of products and organisations*).

Table 4-33s

Parameter	Value (per declared unit)
Demolition	0.626 MJ
Recovery system, specified by type	0 kg for reuse 950 kg for recycling.
Elimination, specified by type	27.5 kg for final disposal (landfill) 22.5 kg for incineration
Assumptions for scenario development (transport of waste to processing site)	Truck: 213.08 km Train: 172.30 km Ship: 454.63 km

Module D: Benefits and loads beyond the system boundary

This module reports the benefits and loads resulting from the net flow of fuels or secondary materials leaving the product system, excluding flows classified as co-products. It is assumed that metals reach the final waste state after a sorting and crushing process. The treatment, as well as the net benefits and burdens of potential reuse or recycling (for the net amount of scrap only), are grouped in this module. Potential environmental benefits are presented for the net steel scrap produced at the end of the product's service life, calculated as follows: Net Scrap = Amount of recycled steel at the end of the product's service life – Scrap originating from previous life cycles of to the product. A 10% reduction coefficient for material loss in avoided product recovery is applied.

5. Environmental performance. LCA and LCI environmental parameter declaration

The results of the end-of-life stages (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

The EN 15804 characterization factors are based on EF 3.1.

Mandatory impact category indicators according to EN 15804

Wire rod for prestressing steel Declared unit: 1 ton							
Parameter	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	9.77E+02	1.00E+02	5.92E+01	4.36E+01	4.81E+00	2.66E-01	-1.96E+02
GWP- fossil	9.68E+02	1.00E+02	5.92E+01	4.36E+01	4.79E+00	2.66E-01	-1.96E+02
GWP- biogenic	7.93E+00	3.58E-03	2.97E-03	1.54E-03	7.47E-03	3.19E-04	-1.92E-02
GWP- luluc	1.92E+00	1.93E-03	2.44E-03	7.73E-04	9.66E-03	8.49E-06	-3.07E-02
ODP	1.51E-05	2.12E-06	9.02E-07	9.52E-07	7.29E-08	5.37E-09	-7.58E-07
AP	2.75E+00	9.26E-01	5.47E-01	2.58E-01	3.02E-02	1.96E-03	-6.61E-01
EP- freshwater	6.89E-02	6.53E-05	5.58E-05	2.77E-05	3.18E-04	9.00E-07	-9.55E-03
EP-marine	7.21E-01	2.99E-01	2.58E-01	8.29E-02	9.07E-03	9.04E-04	-1.42E-01
EP- terrestrial	6.65E+00	3.30E+00	2.83E+00	9,13E-01	9.99E-02	9.92E-03	-1.67E+00
POCP	8.34E+00	1.00E+00	8.44E-01	3.04E-01	3.03E-02	3.03E-03	-5.83E-01
ADP-minerals&metals[2]	1.78E-03	2.29E-06	2.08E-06	1.06E-06	2.67E-07	8.82E-09	-2.69E-05
ADP- fossil[2]	1.35E+04	1.31E+03	7.75E+02	5.73E+02	9.64E+01	3.52E+00	-2.03E+03
WDP[2]	1.54E+02	4.03E-01	5.78E-01	1.79E-01	6.94E-01	4.31E-03	-1.20E+01

GWP - total (kg $CO2_{eq}$): Global warming potential; **GWP - fossil (kg $CO2_{eq}$)**: Global warming potential of fossil fuels; **GWP - biogenic (kg $CO2_{eq}$)**: Biogenic global warming potential; **GWP - luluc (kg $CO2_{eq}$)**: Global warming potential from land use and land-use change; **ODP (kg CFC-11eq)**: Depletion potential of the stratospheric ozone layer; **AP (mol H+ eq)** : Acidification potential, cumulative Exceedance; **EP-freshwater (kg Peq)**: Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-marine (kg Neq)**: Eutrophication potential, fraction of nutrients reaching marine end compartment; **EP-terrestrial (mol Neq)**: Eutrophication potential, Accumulated Exceedance; **POCP (kg NMVOCeq)**: Formation potential of tropospheric ozone; **ADP-minerals&metals (kg Sbeq)**: Abiotic depletion potential for non-fossil resources; **ADP -fossil (MJ, vcn)**: Abiotic depletion for fossil resources potential; **WDP (m^3):** Water (user) deprivation potential, deprivation-weighted water consumption.

Additional mandatory and voluntary impact category indicators

Wire rod for prestressing steel Declared unit: 1 ton							
Parameter	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG*	9.77E+02	1.00E+02	5.92E+01	4.36E+01	4.81E+00	2.66E-01	-1.96E+02
PM	5.13E-05	6.83E-06	1.58E-05	2.87E-06	4.66E-07	7.28E-08	-1.44E-05
IRP[1]	5.80E+01	1,21E-01	6.44E-02	5.40E-02	6.73E-01	3.74E-04	-6.30E-01
ETP- fw[2]	4.46E+03	8.43E+01	2.22E+01	3.11E+01	6.68E+00	5.16E+00	-5.11E+02
HTP-c[2]	3.83E-07	6.84E-09	3.16E-09	2.81E-09	4.26E-10	3.65E-10	-2.88E-07
HTP- nc[2]	5.17E-06	4.38E-07	5.82E-08	2.29E-07	1.80E-08	1.48E-09	-3.77E-07
SQP[2]	2.51E+03	1.68E+00	1.32E+00	7.32E-01	8.65E+00	3.42E+00	-1.98E+02

GWP-GHG (kg $CO2_{eq}$): Global warming potential excluding biogenic carbon; **PM (disease incidence)**: Potential incidence of diseases due to particulate matter emissions; **IRP (kBq U235eq)**: Human exposure potential relative to U235; **ETP-fw (CTUe)**: Comparative unit toxic potential for ecosystems - freshwater; **HTP-c (CTUh)**: Comparative unit toxic potential for ecosystems - carcinogenic effects; **HTP-nc (CTUh)**: Comparative unit toxic potential for ecosystems - non-carcinogenic effects; **SQP (Pt)** : Soil quality potential index.

Disclaimer 1. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Disclaimer 2. The results of this environmental impact indicator should be used with caution as the uncertainties of the results are high and experience with this parameter is limited.

**This indicator accounts for all greenhouse gases except for the absorption and emission of biogenic carbon dioxide and biogenic carbon stored in the product. Therefore, the indicator is identical to the total GWP, except that the conversion factor for biogenic CO_2 is set to zero.*

Resource use indicators

Wire rod for prestressing steel Declared unit: 1 ton							
Parameter	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	1.19E+03	3.08E+00	1.66E+00	1.38E+00	1.65E+01	1.18E-02	-2.25E+01
PERM	1.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	1.20E+03	3.08E+00	1.66E+00	1.38E+00	1.65E+01	1.18E-02	-2.25E+01
PENRE	1.35E+04	1.31E+03	7.75E+02	5.73E+02	9.69E+01	3.54E+00	-2.03E+03
PENRM	2.02E+00	0.00E+00	0.00E+00	0.00E+00	-5.05E-01	-2.66E-02	0.00E+00
PENRT	1.35E+04	1.31E+03	7.75E+02	5.73E+02	9.64E+01	3.52E+00	-2.03E+03
SM	7.92E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	8.26E+00	2.31E-02	2.35E-02	1.05E-02	4.54E-02	1.67E-04	-3.44E-01

PERE (MJ, vcn): Use of renewable primary energy excluding renewable primary energy resources used as raw materials; **PERM (MJ, vcn):** Use of renewable primary energy used as a raw material; **PERT (MJ, vcn):** Total use of renewable primary energy resources; **PENRE (MJ, vcn):** Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; **PENRM (MJ, vcn):** Use of non-renewable primary energy resources used as raw materials; **PENRT (MJ, vcn):** Total use of non-renewable primary energy re-sources; **SM (kg)**: Use of secondary materials; **RSF (MJ, vcn):** Use of renewable secondary fuels; **NRSF (MJ, vcn):** Use of non-renewable secondary fuels; **FW (m^3)**: Use of net fresh water.

Waste indicators

Wire rod for prestressing steel Declared unit: 1 ton							
Parameter	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	4.67E-02	8.32E-03	5.32E-03	3.72E-03	2.88E-04	2.30E-05	-2.27E-02
NHWD	1.64E+02	3.95E-02	2.77E-02	1.81E-02	4.95E-02	4.23E+01	-2.55E+00
RWD	3.54E-02	7.50E-05	3.61E-05	3.37E-05	5.53E-04	2.34E-07	-4.32E-04

HWD (kg): Hazardous waste disposed; **NHWD (kg)**: Non-hazardous waste disposed; **RWD (kg)**: Radioactive waste disposed.

Output flow indicators

Wire rod for prestressing steel Declared unit: 1 ton							
Parameter	**A1-A3**	**A4**	**C1**	**C2**	**C3**	**C4**	**D**
CRU	9.36E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	2.78E+01	0.00E+00	0.00E+00	0.00E+00	9.50E+02	0.00E+00	0.00E+00
MER	1.99E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU (kg): Components for reuse; **MFR (kg)**: Materials for recycling; **MER (kg)**: Materials for energy recovery; **EEE (MJ)**: Exported energy, electricity; **EET (MJ)**: Exported energy, thermal.

6. Additional environmental information

6.1. Other indicators

The manufacture of the studied steel products generates the following co-products intended for sale to third parties:

Table 6-1. Co-products

Parameter	kg (per declared unit)
Scale	1.10E+01
Steelmaking dust	9.03E+00
Slag	4.75E+01
Refractory material	2.59E-01
Non-ferrous waste	1.47E+00

6.2. Indoor air emissions

The manufacturers state that the studied steel does not generate emissions into the indoor air during its service life.

6.3. Emissions to soil and water

The manufacturers state that the studied steel does not generate significant emissions to the soil or water during its service life.

6.4. Biogenic carbon content

The manufacturers state that the studied products do not contain materials with biological content.

Biogenic carbon-based packaging used for product distribution is shown in the following table:

Table 6-22 Biogenic carbon

Parameter	kg biogenic C (per declared unit)
Product	0
Packaging	3.22E-01

6.5. Electrical mix used

The residual electricity mix from the CNMC has been used for each plant in 2022:

Table 6-33 Energy mix

Mix - GWP - gCO_2 eq /kWh	
Supplier's residual mix: weighted average by plant production	261.83

References

[1] UNE 36904-1:2018. Iron and steel industry. Environmental product declarations. Product category rules for steel products for concrete and steel structures. Part 1: Hot rolled non-alloy steel long products from electric furnace.

[2] EN 15804:2012+A2:2019/AC:2021. Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.

[3] General Programme Instructions of the GlobalEPD, 3rd revision. AENOR. October 2023.

[4] EN ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures. (ISO 14025:2006).

[5] EN ISO 14040:2006/A1:2021. Environmental Management. Life Cycle Assessment. Principles and framework. Amendment 1. (ISO 14040:2006/ Amd 1:2020).

[6] EN ISO 14044:2006/A1:2021. Environmental Management. Life cycle assessment. Requirements and guidelines. Amendment 2. (ISO 14044:2006/ Amd 2:2020).

[7] Life cycle assessment report for sector Environmental Product Declarations for “Sostenibilidad Siderúrgica” partners, developed by Abaleo SL, November 2025. Version 2.

[8] Databases and methodologies for environmental impact assessment applied using SimaPro 10.2.0.0.

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